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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/067,208	04/28/1998	WILLIAM G. HOWARD	P-7860	9814

7590

04/26/2002

GIRMA WOLDE-MICHAEL
MEDTRONIC INC
7000 CENTRAL AVENUE NE
MINNEAPOLIS, MN 55432

EXAMINER

CREPEAU, JONATHAN

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 04/26/2002

21

Please find below and/or attached an Office communication concerning this application or proceeding.

MF-21

Office Action Summary

Application No.

09/067,208

Applicant(s)

HOWARD, WILLIAM G.

Examiner

Jonathan S. Crepeau

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10-17, 28-35, 37-44, 46-53, 55-61 and 92-101 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

- 5) ☐ Claim(s) _____ is/are allowed.

- 6) ☒ Claim(s) 1-8, 10-17, 28-35, 37-44, 46-53, 55-61, and 92-101 is/are rejected.

- 7) ☐ Claim(s) _____ is/are objected to.

- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This Office action addresses claims 1-8, 10-17, 28-35, 37-44, 46-53, 55-61, and 92-101. The terminal disclaimer filed on February 15, 2002 has been found to be defective for the reasons set forth below, and accordingly, claims 1, 3-8, 10, 12-17, and 95-97 remain rejected under the doctrine of obviousness-type double patenting over the '760 patent. All the claims remain rejected under 35 USC §103 for substantially the reasons of record. Accordingly, this action is made final.

Terminal Disclaimer

2. The terminal disclaimer filed on February 15, 2002 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent 5,439,760 has been reviewed and is NOT accepted.

It does not include a recitation that any patent granted shall be enforceable only for and during such period that said patent is commonly owned with the application(s) or patent(s) which formed the basis for the double patenting rejection. See 37 CFR 1.321(c)(3).

3. An attorney or agent, not of record, is not authorized to sign a terminal disclaimer in the capacity as an attorney or agent acting in a representative capacity as provided by 37 CFR 1.34 (a). See 37 CFR 1.321(b) and/or (c).

Double Patenting

4. Claims 1, 3-8, 10, 12-17, and 95-97 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-71 of U.S. Patent No. 5,439,760 (Howard et al). Although the conflicting claims are not identical, they are not patentably distinct from each other because while the claims of the '760 patent do not use the term "end segment," they recite "outermost layers" which in fact correspond to the end segments of the instant claims. The claims of the '760 patent also recite the other features of the instant claims, namely the pouch-type separators, current collector materials, and cathode materials.

Claim Rejections - 35 USC § 103

5. Claims 1, 3, 10, 12, and 95-97 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmode (U.S. Patent 5,008,165) in view of Crabtree (U.S. Patent 4,539,271).

In Figures 2-7, Schmode teaches an electrochemical cell comprising a wound electrode assembly (7) comprising elongated anode (11) and cathode (9) assemblies. As taught in the abstract, the outermost layer of the coil comprises an end segment of the anode assembly. As shown in Figures 3 and 4, the anode assembly comprises an anode current collector (12) having a tab extending from an edge thereof and a strip of alkali metal (8') disposed thereon. The cathode assembly comprises a cathode current collector (13) having a tab extending from an edge thereof and a cathode material (9) bonded thereto. As taught in column 6, line 11, the anode current collector can be made of copper. The cathode current collector has a shorter length than the strip of alkali metal (8').

Schmode does not expressly teach the presence of pouch-type separators individually surrounding the anode and cathode assemblies.

The patent of Crabtree is generally directed to wound lithium electrochemical cells having a pouch-type separator enclosing each electrode assembly, as shown in the Figures.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because Crabtree provides sufficient motivation for an artisan to use her separator configuration in the cell of Schmode. In column 3, line 67-column 4, line 17, Crabtree teaches that her configuration provides for a method of manufacture which is readily adaptable to high speed automated techniques by eliminating the need for hand mating of the electrodes. Additionally, Crabtree teaches the separators are less likely to be torn after insertion into the electrochemical cell. Accordingly, the artisan would have sufficient motivation to use this separator configuration in the cell of Schmode.

Regarding the process limitations recited in instant claims 95 and 96, the courts have generally held that process limitations in product/apparatus claims do not need to be accorded patentable weight because they do not limit the structure of the claimed product. Accordingly, these limitations are not considered to distinguish over the references.

6. Claims 4-8 and 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmode in view of Crabtree as applied to claims 1, 3, 10, 12, and 95-97 above, and further in view of Keister et al (U.S. Patent 4,830,940).

Schmode does not expressly teach that the cathode current collector is formed of titanium or that the cathode mix comprises a silver vanadium oxide cathode active material, a PTFE binder, or a carbon conductivity enhancer.

In column 8, lines 34-41, Keister et al. teach lithium battery having a cathode mix comprising a silver vanadium oxide cathode active material, a PTFE binder, and a carbon conductivity enhancer. Keister et al. further teach in column 4, lines 40-43 that the cathode current collector may be formed of titanium.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would possess sufficient motivation to use these materials in the cell of Schmode. In the abstract, Keister et al. state that the use of the silver vanadium oxide provides their cell with high volumetric capacity and high rate capability, among other advantages. Accordingly, and artisan would be sufficiently motivated to use the materials of the cathode assembly of Keister et al. in the cathode assembly of Schmode.

7. Claims 2, 11, 28-35, 37-44, 46-53, 55-61, 92-94, and 98-101 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al (U.S. Pat. 5,549,717) in view of Howard et al.

In Figure 4 and in column 3, line 36-column 4, line 55, Takeuchi et al. teach an electrode assembly having two substantially straight sides and comprising spirally-wound anode and

cathode assemblies. The anode assembly comprises a nickel current collector (68) and lithium strips (64, 66). A tab (72) extends from the edge of current collector 68. Current collector 68 has a smaller length and width than the length and width of lithium strip 66 (see col. 4, line 39). The cathode assembly comprises silver vanadium oxide active material (47) which is embedded into a titanium current collector (54). The current collector 54 comprises tabs (48, 50) extending from the edges. Takeuchi et al. incorporate by reference the disclosure of Keister et al (U.S. Pat. 4,830,940), which discloses that the cathode can comprise a mixture of silver vanadium oxide, PTFE binder, and graphite powder conductivity enhancer (col. 8, lines 37-42 of Keister et al). In column 4, line 26, Takeuchi et al. disclose that the separator surrounding the cathode assembly is sealed on all three open sides so that only the tabs project. In column 5, line 25, Takeuchi et al. disclose that alternatively, a separator may be folded around the anode assembly in a manner similar to the cathode assembly. In Figures 7, 8, and 10 and in column 5, line 63 et seq., the reference discloses that the portion of the anode (80) around the periphery of the electrode assembly (i.e., the "end segment") requires only one lithium strip.

Takeuchi et al. do not explicitly teach that the anode current collector forms the outermost layer of the electrode assembly, or that the cathode current collector is shorter than the lithium strip by an amount that enables the end segment of the anode assembly to be wound into the outermost layer. Takeuchi et al. also do not explicitly teach the exact length of the anode current collector as a percentage of the length of the lithium strip, or that separators cover both the cathode and anode assemblies simultaneously.

Howard et al. teach pocket-type separators covering spirally wound anode and cathode assemblies in column 3, lines 37-46. Additionally, Howard et al. teach in Figure 10 and in

column 6, lines 53-65 that the length of the alkali metal strip (15) is longer than the length of the cathode current collector by an amount that enables the end segment of the anode assembly to be wound into the outermost layer.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the patent of Howard et al. shows that using separators simultaneously on the anode and cathode assemblies is well known in the art.

Although Takeuchi et al. in effect disclose that a separator is placed on either the anode *or* the cathode assembly, the artisan would understand that covering both electrode assemblies (as shown by Howard et al.) would be an advantageous modification of the battery of Takeuchi et al. because dendrite protection would be increased and delamination of both active material layers would be decreased. As stated in Howard et al. at column 3, line 40, "[t]he separator pouch then prevents the transport of stray material in the cell which could cause a short circuit and the double thickness of the separator between anode and cathode elements better resists damage during the winding process". The separators are made by a folding and sealing method (col. 5, lines 33-68 of Howard et al.). Additionally, although Takeuchi et al. do not explicitly teach that tab(s) project through slits in the separators, this configuration is also clearly shown in Howard et al. and is considered to be obvious to the skilled artisan.

Furthermore, the disclosure of Takeuchi et al. provides sufficient guidance for the artisan to ascertain that the anode current collector forms the outer layer (winding) of the electrode assembly. As stated above, the reference discloses that the portion of the anode around the periphery of the electrode assembly requires only one lithium strip. From this disclosure, the artisan would be able to ascertain that the one lithium strip would be present on the inside

portion of the anode current collector, in order to make contact with a corresponding cathode active material layer. Accordingly, it would be well within the skill of the art to ascertain that the anode current collector would form the outer layer of the electrode assembly. Additionally, it is noted that the Howard et al. reference is also concerned with the having the anode current collector in the outermost layer of the cell. Therefore, the way that Howard et al. achieve this configuration (by making the cathode current collector shorter than the lithium strip, as set forth above) is deemed to be an obvious way of achieving this same configuration in the battery of Takeuchi et al.

Finally, the length of the current collector is a parameter which may be optimized by the artisan to achieve a particular result, i.e., the utilization rate of active material, current density, etc. It has been held that the discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

Response to Arguments

8. Applicant's arguments filed February 15, 2002 have been fully considered but they are not persuasive. Applicant maintains the position that the '760 patent (Howard et al.) supports the claimed limitation that the anode current collector is shorter in length than the alkali metal strip. Applicant cites Figure 1 of the '760 patent and asserts that the anode current collector 5 is shorter in length than the alkali metal layer 10. It is assumed that the Applicant means the alkali metal

layer 15, since alkali metal layer 10 is clearly shorter than current collector 5. The Examiner acknowledges that Figures 1 and 3A of the '760 patent show that the edge of the strip 15 appears to extend beyond the edge of the current collector 5. However, it is unclear from these Figures what the configuration is on the *other end* of the anode assembly. In Figure 1, the top layer of alkali metal (10) obscures the view on the left-hand side of the end portions of the alkali metal layer 15 and the current collector 5. Absent a disclosure of this type, e.g. that the alkali metal layer 15 extends beyond the current collector 10 at this end or at least terminates flush with the current collector, it is not clear that the inventors of the '760 patent had possession of or specifically envisioned the feature that the collector 5 is shorter than the layer 15. Additionally, there appears to be no relevant disclosure in the text of the patent that refers to the relative lengths of the collector 5 and the layer 15 or the ending points of each. Accordingly, the Examiner maintains that the recitation of the anode collector being shorter than the alkali metal layer is not properly supported under 35 USC §112, first paragraph, by the '760 patent.

Applicant also asserts that there is no teaching or suggestion of the anode current collector being shorter in length than the elongated strip of alkali metal in the '165 patent (Schmode) or the '271 patent (Crabtree). However, these references are not relied upon to teach such a feature. Claims 1, 3-8, 10, 12-17 and 95-97, which are rejected under 35 USC §103 over these references, do not recite this feature. Accordingly, this argument is not germane to claims 1, 3-8, 10, 12-17 and 95-97, and these claims remain rejected over the Schmode and Crabtree references.

Conclusion

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

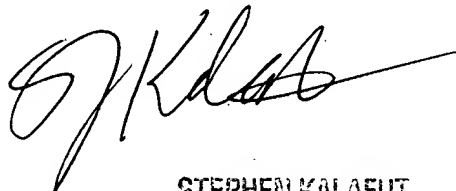
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (703) 305-0051. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (703) 308-2383. The phone number for the organization where this application or proceeding is assigned is (703) 305-5900. Additionally, documents may be faxed to (703) 305-5408 or (703) 305-5433.

Any inquiry of general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

JSC

April 23, 2002



STEPHEN KALAFUT
PRIMARY EXAMINER
GROUP 1700